Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and 5G: A Plan for the Lower 900 MHz Band (902-928 MHz)	))))	WT Docket No. 24-240 RM-11989

COMMENTS OF WI-FI ALLIANCE

Wi-Fi Alliance®[1] submits these comments in response to the Public Notice[2] issued by the Wireless Telecommunications Bureau and Office of Engineering and Technology (collectively the "Bureaus") in the above-referenced proceeding regarding the Petition for Rulemaking ("Petition") filed by NextNav Inc. ("NextNav").[3] NextNav requests that the Commission reconfigure the 902-928 MHz band ("Lower 900 MHz Band" or the "Band") to enable the deployment of a 5G terrestrial positioning, navigation, and timing ("PNT") network to support the United States Global Positioning System. Wi-Fi Alliance appreciates the need to ensure the provision of accurate PNT information. But it questions whether the rearrangement of the Lower 900 MHz Band is the best way to meet those needs. The Lower 900 MHz Band has a complex regulatory structure, and its availability is essential to the continued use of millions of unlicensed devices that provide low-cost wireless connectivity to a multitude of products used by American households. Contrary to the Commission's intent when it adopted rules governing the Location and Monitoring Service ("LMS"), NextNav has provided no evidence, testing, or other assurance that unlicensed devices will be able to coexist without experiencing harmful interference in the reconfigured Lower 900 MHz Band. Accordingly, Wi-Fi Alliance urges the Commission to dismiss the Petition.

---

[1] Wi-Fi®, the Wi-Fi logo, the Wi-Fi CERTIFIED logo, Wi-Fi Protected Access® (WPA), WiGig®, the Wi-Fi ZONE logo, the Wi-Fi Protected Setup logo, Wi-Fi Direct®, Wi-Fi Alliance®, WMM®, and Miracast® are registered trademarks of Wi-Fi Alliance. Wi-Fi CERTIFIED™, Wi-Fi Protected Setup™, Wi-Fi Multimedia™, WPA2™, Wi-Fi CERTIFIED Passpoint™, Passpoint™, Wi-Fi CERTIFIED Miracast™, Wi-Fi ZONE™, WiGig CERTIFIED™, Wi-Fi Aware™, Wi-Fi HaLow™, the Wi-Fi Alliance logo and the WiGig CERTIFIED logo are trademarks of Wi-Fi Alliance.

[2] *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment On NextNav Petition For Rulemaking*, Public Notice, WT Docket No. 24-240, DA 24-776 (rel. Aug. 6, 2024) ("*Public Notice*").

[3] NextNav Inc., *Enabling Next-Generation Terrestrial Positioning, Navigation, and Timing and 5G: A Plan for the Lower 900 MHz Band (902-928 MHz)*, Petition for Rulemaking, at i (filed Apr. 16, 2024) ("Petition"). NextNav later supplemented its Petition. *See* Letter from Robert Lantz, General Counsel, NextNav Inc., to Marlene H. Dortch, Secretary, FCC (filed June 7, 2024).

I. THE 900 MHz BAND IS INTENSIVELY USED, INCLUDING FOR UNLICENSED DEVICES

As the Bureaus explain, the Lower 900 MHz Band contains several spectrum allocations that support services that coexist in a carefully balanced spectrum-sharing arrangement.[4/] In particular, federal radiolocation services and industrial, scientific, and medical ("ISM") devices (the latter of which operate under Part 18 of the Commission's rules) may operate in the Lower 900 MHz Band on a primary basis.[5/] Federal fixed and mobile, as well as non-federal LMS licensees, are permitted to operate on a secondary basis to federal radiolocation and ISM devices.[6/] In addition, amateur radio operations are permitted in the band but may only operate on a secondary basis to LMS operations.[7/] And finally, Part 15 radiofrequency devices may operate in the band with the interference protection described below and may not cause harmful interference to LMS, amateur operations, or other licensed systems operating in the Band.[8/]

[4/] *Public Notice* at 1-2.

[5/] *Id.* at 1. Importantly, the Lower 900 MHz Band is also designated for ISM applications in International Radio Regulations and is widely used for Internet of Things ("IoT") deployment in many other countries. *See* 47 C.F.R. § 2.106, n. 5.150 (explaining that the international frequency allocation for Region 2 includes ISM devices and that radiocommunication devices operating in the band must accept harmful interference from ISM devices).

[6/] *Public Notice* at 1-2.

[7/] *Id.* at 2.

[8/] *Id.*

There are millions of Part 15 devices operating in the Band.[9] The unique propagation characteristics of the Lower 900 MHz Band allow transmissions of Part 15 devices to achieve range and penetration, making it ideal for important and innovative Internet of Things ("IoT") applications like smart agriculture, industrial monitoring, smart city infrastructure, and home automation.[10] Notably, many of those devices implement Wi-Fi Alliance's Wi-Fi HaLow™ technology, developed particularly for Wi-Fi and other applications that operate on unlicensed frequencies below 1 GHz. Wi-Fi HaLow™ technology facilitates a "more comprehensive approach to wireless connectivity" by delivering many of the benefits consumers expect from Wi-Fi to a wider range of environments and applications.[11] It does so by offering a longer range and lower power connectivity while capitalizing on Wi-Fi's interoperability, easy setup, and security standards. Wi-Fi HaLow's™ extended range and reduced power consumption are especially useful for applications like sensor networks or wearables that require small batteries and for which penetration through walls or other obstacles is important.[12] In several recent real-world trials, devices utilizing Wi-Fi HaLow™ technology were found to have "longer reach and better penetration than many other IoT systems"[13] and because the technology can leverage standard Wi-Fi systems for upgrades and open standards devices, it was also more cost-effective than many alternatives.[14]

---

[9] *Public Notice* at 4.

[10] *Wi-Fi CERTIFIED HaLow*, WI-FI ALLIANCE, https://www.wi-fi.org/discover-wi-fi/wi-fi-certified-halow (last visited Sept. 5, 2024); *see* George Hardesty, *LoRa: Long Range Wireless for Internet of Things (IOT): Frequency Bands, Antennas* (Oct. 21, 2023), https://www.data-alliance.net/blog/lora-long-range-wireless-for-internet-of-things-iot-frequency-bands/ (noting the "demonstrable efficacy and robustness for low power, wide-area networking" of the Lower 900 MHz Band, which provides "the support necessary for the burgeoning range of IoT applications.").

[11] *Wi-Fi CERTIFIED HaLow supra* note 10.

[12] *Id.* Wi-Fi HaLow™ technology has also successfully demonstrated these benefits in a number of real-world settings, including smart homes, warehouses, agriculture, smart cities, office buildings, schools, and industrial facilities. *See* James Blackman, *Seven cases and places where Wi-Fi HaLow works well for IoT*, RCRWIRELESS NEWS (July 11, 2024), https://www.rcrwireless.com/20240711/fundamentals/seven-cases-and-places-where-wi-fi-halow-works-well-or-iot.

There are already approximately 100,000 Wi-Fi HaLow™ devices currently in operation throughout the United States as a result of these demonstrable benefits, and many more devices are expected to be made operational as early as the end of 2024.[15] For example, Milesight, a smart sensor and IoT product developer, and Morse Micro, a Wi-Fi HaLow™ chip developer, recently announced a partnership to create Wi-Fi HaLow™ variants of Milesight's sensing cameras, people counters, and a Wi-Fi HaLow™ gateway.[16] These devices will target applications ranging from logistics and asset tracking to healthcare and agriculture.[17] In making the announcement, the companies acknowledged that the rapidly increasing global recognition for Wi-Fi HaLow's™ robust performance and reliability, including its extended range and low power consumption, "made it the perfect fit for [this] diverse range of IoT products."[18]

In addition to low-power wide-area networks, the Lower 900 MHz Band is used by a myriad of other ubiquitous wireless consumer devices, such as cordless phones, intercoms, sensors, toys, and garage door openers. And the international designation of the Lower 900 MHz Band for ISM operations facilitates economies of scope and scale for the development and deployment of ISM devices throughout much of the globe. Taken together, the success of the wide range of devices and important applications already operating in the Lower 900 MHz Band demonstrates that the Commission must consider how these devices can continue to operate if the Band is reconfigured as NextNav suggests.

---

[13] Claire Swedberg, *Trials Find Wi-Fi HaLow Offers High Performance IoT Connectivity*, RFID JOURNAL (August 7, 2024), https://www.rfidjournal.com/news/trials-find-wi-fi-halow-offers-high-performance-iot-connectivity/221399/.

[14] *Id.*

[15] *Id.*; *see also* Dan O'Shea, *Wi-Fi HaLow moves forward after completing WBA field trials*, FIERCE ELECTRONICS (July 15, 2024, 12:22 p.m.), https://www.fierceelectronics.com/iot-wireless/wi-fi-halow-moves-forward-after-completing-wba-field-trials (noting that several companies are leading "the early market charge for HaLow" including AT&T, Charter Communications, Nextcomm Systems, and Qualcomm).

[16] Nitin Dahad, *Wi-Fi HaLow smart IoT products emerge, and real world field trials' success*, EMBEDDED (Aug. 19, 2024, 1:31 p.m.), https://www.embedded.com/wi-fi-halow-smart-iot-products-emerge-and-real-world-field-trials-success.

[17] *Id.*

[18] *Id.*

II. NEXTNAV HAS NOT DEMONSTRATED HOW PART 15 DEVICES MAY CONTINUE TO OPERATE

NextNav incorrectly conflates the allocation and licensing status of Part 15 devices.[19/] Merely because those devices are not *licensed* does not mean that the Band is not *allocated* for their use. To the contrary, the Lower 900 MHz band is allocated for use by Part 15 devices, an allocation that has resulted in millions of devices operating in the band today.

Unfortunately, NextNav fails to recognize the material disruption that its proposed change will cause to those millions of devices. NextNav provides no technical demonstration of how its proposal would be achievable or any assessment of the impact its proposal would have on Part 15 operations.[20/] Instead, NextNav merely states that it "is completing technical analyses intended to address representative Lower 900 MHz Band Part 15 uses and will work with unlicensed users to understand their spectrum requirements."[21/] NextNav's statement provides little assurance regarding the ability of Part 15 devices to continue providing important connectivity services today or in the future. Further, NextNav has not yet "worked with" Wi-Fi

---

[19/] Petition at 18 n.65.

[20/] *Public Notice* at 4 ("The Petition recognizes that there currently are unlicensed part 15 devices operating in the Lower 900 MHz Band, but it is unclear regarding the extent to which the proposed reconfiguration would impact potentially millions of such devices.").

[21/] Petition at 31.

Alliance – a representative of one of the largest segments of Part 15 users in the Lower 900 MHz Band. Finally, NextNav mischaracterizes the carefully engineered arrangement in the Band that ensures equitable spectrum access for Part 15 devices as evidence that these devices can accept significantly higher levels of interference from multilateration LMS ("M-LMS") transmissions and accommodate the introduction of nationwide fixed (point-to-point and point-to-multipoint) and mobile operations.[22/]

The changes NextNav proposes are fundamentally inconsistent with the approach the Commission adopted for the Lower 900 MHz Band. The proliferation of Part 15 devices in the Lower 900 MHz Band is precisely the result of the Commission's decision to incorporate protections for Part 15 operations when it adopted the rules governing LMS in 1995.[23/] It has retained those provisions without modification for nearly 30 years. In particular, Section 90.353(d) states that LMS operations will not be authorized until the licensee is able to demonstrate that it will not cause unacceptable levels of interference to Part 15 devices.[24/] Importantly, the Commission was explicit that the "field-testing requirement" for M-LMS was adopted for the protection of Part 15 operations.[25/] The Commission later reaffirmed this decision and again clarified the purpose of the field-testing requirements, explaining that through the requirement, the Commission intended to facilitate band sharing and minimize interference to Part 15 operations. Further, and as part of that effort, it sought to ensure that LMS systems would not be operated in such a manner as to degrade, obstruct, or interrupt Part 15 devices to

---

[22/] *Id.* at 17-21.

[23/] *Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Report and Order, 10 FCC Rcd 4695 (1995) ("*Part 90 Report and Order*").

[24/] *See id.* ¶¶ 81-82; 47 C.F.R. § 90.353(d).

[25/] *Part 90 Report and Order* ¶ 82 ("To provide such protection and to facilitate band sharing and minimize interference to Part 15 operations [M-LMS] licensees may employ any number of technical refinements.").

such an extent that Part 15 operations would be negatively affected.[26/] To effectuate its Part 15 protection provision, the Commission also adopted Section 90.361 to define the operational envelope within which Part 15 devices are not considered to cause harmful interference to LMS systems.[27/]

The Commission has, in fact, previously required NextNav's predecessor[28/] to satisfy the provisions of Section 90.353(d) prior to initiating service. In 2011, the Bureaus granted Progeny a limited waiver of certain Lower 900 MHz Band build-out requirements, but in doing so, reiterated the importance of "demonstrat[ing] *through actual field tests* that its M-LMS system [would] not cause unacceptable levels of interference to Part 15 devices."[29/] Ultimately, the Bureaus conditioned Progeny's waiver on the company submitting a field-test report demonstrating no significant interference issues with Part 15 devices prior to commencing operations.[30/] This field-testing report was referenced in a Public Notice for comment, and the Bureaus closely reviewed the record before finally permitting Progeny to begin operating M-LMS devices.[31/]

Now, NextNav proposes to eviscerate these critical coexistence arrangements. Its proposed Section 90.1410(c) would not include any protections for Part 15 devices or provisions that would insulate Part 15 devices from claims of harmful interference to LMS systems.

[26/] *Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicular Monitoring Systems*, Order on Reconsideration, 11 FCC Rcd 16905, ¶ 16 (1996).

[27/] 47 C.F.R. § 90.361.

[28/] Progeny LMS, LLC ("Progeny").

[29/] *Request by Progeny LMS, LLC for Waiver of Certain Multilateration Location and Monitoring Service Rules*, Order, 26 FCC Rcd 16878, ¶ 24 (WTB/OET 2011).

[30/] *Id.* ¶ 29.

[31/] *See Progeny LMS, LLC Demonstration of Compliance with Section 90.353(d) of the Commission's Rules*, Order, 28 FCC Rcd 8555 (2013).

NextNav would, therefore, upend the investment-backed plans of device manufacturers and disrupt the operations of millions of devices in existence today.

Accordingly, NextNav's claims that coexistence between its NextGen system and Part 15 devices is possible – under the dramatically changed regulatory structure it proposes – are disingenuous.

III. CONCLUSION

The stable Commission regulatory framework for the Lower 900 MHz Band has enabled the development of innovative technologies that are a cornerstone of many IoT applications and provide a reliable and efficient means of connectivity for a wide range of devices. The regulatory changes proposed would drastically and detrimentally alter the operational environment for those devices. NextNav provides no meaningful explanation of how Part 15 devices would continue to operate in the same manner they do today and with the same rules-based interference protections. Accordingly, the Commission should dismiss NextNav's Petition.

Respectfully submitted,

/s/ *Alex Roytblat*
Alex Roytblat

Vice President
Worldwide Regulatory Affairs

WI-FI ALLIANCE
10900-A Stonelake Blvd. Suite 195
Austin, TX 78759
(512) 498-9434
aroytblat@wi-fi.org

September 5, 2024

CERTIFICATE OF SERVICE

Pursuant to Section 1.405(a) of the Commission's rules, I, Jonathan Garvin, certify that on September 5, 2024, a copy of the foregoing Comments of Wi-Fi Alliance was served by electronic mail[1/] on the following:

Ruth Milkman
Partner
QUADRA PARTNERS, LLC
2001 L Street, NW, Suite 500
Washington, DC 20004 USA
ruth.milkman@quadrapartnersllc.com

Advisors to NextNav Inc.

/s/ Jonathan P. Garvin
Jonathan P. Garvin

JPGarvin@mintz.com

[1/] Pursuant to Section 1.47(d) of the Commission rules, documents may be served upon a party via electronic email with the consent of the party to be served.